

Amendment
Serial No. 09/782,169
Attorney Docket No. 010164

REMARKS

Claims 1-15, 17 and 18 are pending. Claim 1 is amended hereby.

Item 2 of the Office Action indicates that claims 1-18 remain pending in the application with claims 14-16 being directed to a non-elected invention. The Examiner requests cancellation of these claims. However, claims 14-16 were already canceled in the Amendment filed on December 30, 2002.

In item 4 of the Office Action, the Examiner indicates that the Declaration has been noted and considered. An executed copy of the declaration is filed herewith.

Claims 1-11, 13, 17 and 18 were rejected under 35 USC §102(b) as being anticipated by JP 62-60640. The Examiner asserts that JP '640 "teaches sputtering or vapor depositing a metal atop a thermoplastic polyimide sheet and heating to form the laminated film." On page 5 of the Office Action, the Examiner explains that JP '640 is considered to teach these features apparently based on Example 9 shown in the Table of the translation. The Examiner is incorrect.

In JP '640, in Examples 1 to 8 thereof wherein a copper foil was used, heat and pressure were applied as the Examiner indicated. However, applicants claim a method for directly forming a conductor layer, which more closely corresponds to "Example 9" of JP'640 than Examples 1-8.

The present claim 1 is novel in view of JP'640 in that a heating step is necessary after a conductor layer is directly formed using a method such as a chemical plating method. Example 9 of JP'640 does not disclose or suggest that a heating step is necessary after chemical plating is conducted. Accordingly, applicants strongly believe the Examiner's assertion that the present claims are not novel in view of JP '640 is incorrect.

As it is apparent from the present Examples and the additional data in the Declaration, this heating step is very important in the present invention.

JP' 640 does not teach sputtering or vapor depositing a metal atop a thermoplastic polyimide sheet and heating to form the laminated film. Example 9 does disclose heating when the thermoplastic polyimide mixture is cast into a sheet. Example 9, however, does not disclose heating after the copper was deposited. This should be clearly evident from Table 1 which does not report a press temperature, as compared with the other examples which all report a press temperature when laminating a foil onto a thermoplastic polyimide.

The Examiner further comments on page 5 of the Office Action that the claims do not exclude the steps of forming the conductor layer and heating from being performed simultaneously. Applicants respectfully disagree.

As an example, claim 1 sets forth the step of forming at least one conductor layer directly on at least one of the thermoplastic polyimide surfaces. Claim 1 then sets forth a step of heating said laminate. The preamble of claim 1 defines a laminate as comprising a polyimide and a conductor layer. Thus, the heating can only be performed after the laminate is formed, i.e., after

at least one conductor layer is directly formed on at least one of the thermoplastic polyimide surfaces. As such, the claims do exclude the steps being performed simultaneously.

Claim 1 has been amended to further make this distinction clear. That is, claim 1 is amended to state heating said laminate after said laminate is formed.

Independent claim 2 contains similar language. That is, claim 2 also requires heating said laminate.

As indicated above, Example 9 of JP'640 only describes forming a conductor layer by chemical plating, and does not teach or suggest a subsequent heating step. Accordingly, JP' 640 fails to teach or suggest the presently claimed invention.

Claims 1-9, 13, 17 and 18 were rejected under 35 USC §102(b) as being clearly anticipated by Chen et al. or Shiotani et al. This rejection is respectfully traversed.

The Examiner apparently makes this rejection based on the same reasoning discussed above. That is, the Examiner does not consider the claims as excluding the steps being performed simultaneously. However, as noted above, the claims require heating said laminate, and therefore, the heating step necessarily is separate from the forming step.

Shinotani et al. (U.S. 5,741,598) only discloses a method for laminating a copper foil, and does not disclose or suggest a method for directly forming a conductor layer as claimed.

It is acknowledged that heating at the time of forming a conductor layer can occur. That is, when the conductor layer is formed, certain heat (i.e., 40-80°C) may be generated. However, the cited references fail to teach or suggest a subsequent heating step.

Claim 17 requires “heating said laminate”, and therefore, necessarily requires two separate steps. Claim 18 does not use this language. However, claim 18 does require “heating the thermoplastic polyimide and the formed conductor layer.” Thus, claim 18 requires the conductor layer to be formed, and then the heating step.

Claims 10 and 11 were rejected under 35 USC §103(a) as being unpatentable over Chen et al. or Shiotani et al. in combination with JP’ 640. In this rejection, the Examiner acknowledges that Chen et al. and Shiotani et al. fail to teach a dry plating method for coating the metal layer on the polyimide layer. It is believed that this admission overcomes the above-noted anticipation rejection of claim 17 which also requires dry plating. In any event, the combined teachings of the references do not teach separate steps of forming a metal conductor layer and heating said laminate.

Claim 12 was rejected under 35 USC §103(a) as being unpatentable over JP’ 640 or Chen et al. or Shiotani et al. in combination with JP’ 640 further in combination with Ameen et al. The Examiner acknowledges that the primary references do not teach wet coating a metal atop a dry coated metal. Ameen et al. is applied by the Examiner for allegedly rendering this feature obvious. However, the combination of references does not teach the separate forming and heating steps noted above.

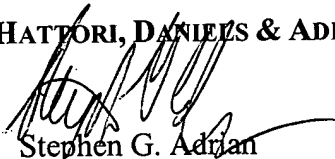
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For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

Should the Examiner deem that any further action by applicants would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicants' undersigned attorney.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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Attachment: Executed Declaration